



**CHENMKO ENTERPRISE CO.,LTD**

**SURFACE MOUNT**

**P-Channel Enhancement Mode Field Effect Transistor**

VOLTAGE 40 Volts CURRENT 20 Ampere

**CHM4301PAPT**

Lead free devices

**APPLICATION**

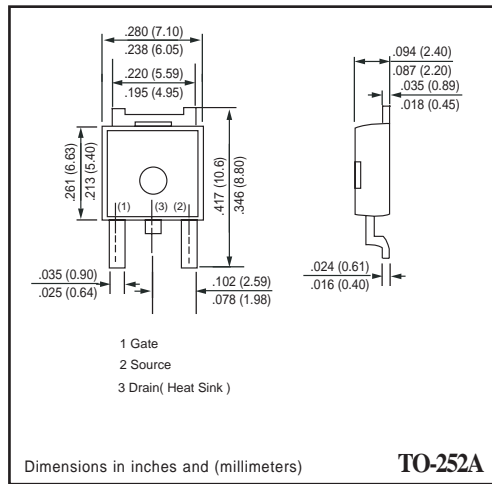
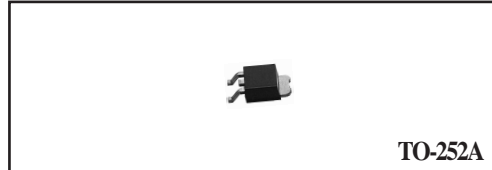
- \* Servo motor control.
- \* Power MOSFET gate drivers.
- \* Other switching applications.

**FEATURE**

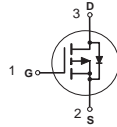
- \* Small flat package. ( TO-252A )
- \* Super high density cell design for extremely low  $R_{DS(ON)}$ .
- \* High power and current handling capability.

**CONSTRUCTION**

- \* P-Channel Enhancement



**CIRCUIT**



**Absolute Maximum Ratings**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	CHM4301PAPT	Units
$V_{DSS}$	Drain-Source Voltage	-40	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Maximum Drain Current - Continuous	-20	A
	- Pulsed (Note 3)	-80	
$P_D$	Maximum Power Dissipation	31	W
$T_J$	Operating Temperature Range	-55 to 150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

- Note : 1. Surface Mounted on FR4 Board ,  $t \leq 10\text{sec}$   
 2. Pulse Test , Pulse width  $\leq 300\mu\text{s}$  , Duty Cycle  $\leq 2\%$   
 3. Repetitive Rating , Pulse width limited by maximum junction temperature  
 4. Guaranteed by design , not subject to production trsting

**Thermal characteristics**

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	50	$^\circ\text{C/W}$
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## RATING CHARACTERISTIC CURVES ( CHM4301PAPT )

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
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### OFF CHARACTERISTICS

$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -32\text{ V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
$I_{GSSF}$	Gate-Body Leakage	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			+100	nA
$I_{GSSR}$	Gate-Body Leakage	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$			-100	nA

### ON CHARACTERISTICS (Note 2)

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1		-3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = -10\text{ V}, I_D = -12\text{ A}$		32	42	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -8\text{ A}$		50	65	
$g_{FS}$	Forward Transconductance	$V_{DS} = -5\text{ V}, I_D = -8\text{ A}$		12		S

### Dynamic Characteristics

$C_{iss}$	Input Capacitance	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		1115		$\text{pF}$
$C_{oss}$	Output Capacitance			205		
$C_{rss}$	Reverse Transfer Capacitance			120		

### SWITCHING CHARACTERISTICS (Note 4)

$Q_g$	Total Gate Charge	$V_{DS} = -20\text{ V}, I_D = -5\text{ A}$ $V_{GS} = -10\text{ V}$		19	25	nC
$Q_{gs}$	Gate-Source Charge			2.1		
$Q_{gd}$	Gate-Drain Charge			3.4		
$t_{on}$	Turn-On Time	$V_{DD} = -20\text{ V}$ $I_D = -5.0\text{ A}, V_{GS} = -10\text{ V}$ $R_{GEN} = 3\ \Omega$		12	25	nS
$t_r$	Rise Time			5	15	
$t_{off}$	Turn-Off Time			40	80	
$t_f$	Fall Time			13	30	

### DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

$I_S$	Drain-Source Diode Forward Current	(Note 1)			-20	A
$V_{SD}$	Drain-Source Diode Forward Voltage	$I_S = -1.0\text{ A}, V_{GS} = 0\text{ V}$ (Note 2)			-1.3	V

# RATING CHARACTERISTIC CURVES ( CHM4301PAPT )

## Typical Electrical Characteristics

Figure 1. Output Characteristics

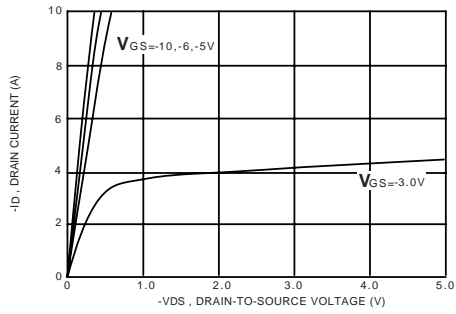


Figure 2. Transfer Characteristics

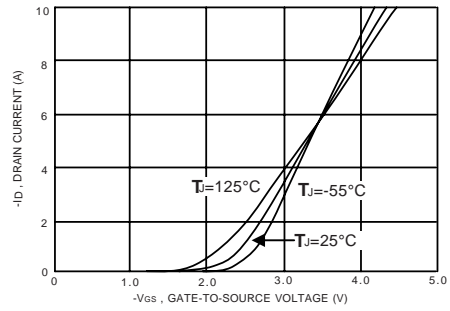


Figure 3. Gate Charge

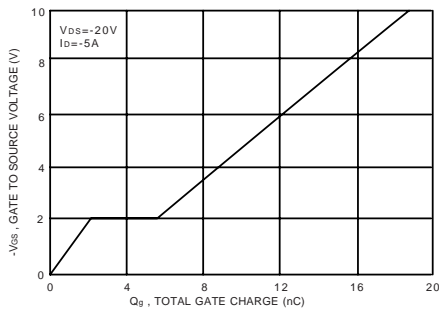


Figure 4. On-Resistance Variation with Temperature

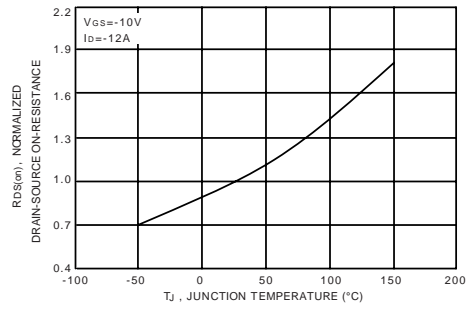


Figure 5. Gate Threshold Variation with Temperature

